

Solar Water Heater

The accompanying photos show a novel solar hot water heating system with a high efficiency heat storage segment that derives from technology developed for the NASA Skylab orbiting laboratory of the early 1970s. Called Energy Garden™ and manufactured by Exemplar, Inc., Hickory, North Carolina, the system offers computerized control with an innovative voice synthesizer that literally allows the control unit to talk to the system user; it reports time of day, outside temperature and system temperature, and asks questions as to how the user wants the system programmed.

At top right is a ground installation of the Energy Garden Master Module, which measures four by eight feet and can also be roof mounted. The Master Module collects energy from the Sun and either transfers it directly to the home water heater or stores it until needed. The computerized control regulates all internal operational functions of the appliance and allows pushbutton reprogramming—after consulting with the Energy Garden voice—on an hourly,

daily, weekly or indefinite basis for maximum efficiency. The programmer draws on conventional energy only when solar radiation is inadequate for hot water demands.

With a single Master Module, says Exemplar, the Energy Garden will deliver 40-70 percent of the hot water needed for a typical family of four. With an optional Amplifier unit added to the Master Module (below right), Energy Garden can supply 69-90 percent of the same family's needs. A higher efficiency, second generation unit called FRESOURCE™ was introduced in March 1987.

A key part of the Energy Garden/FRESOURCE systems is a patented three-way heat exchanger coupled with a latent heat storage technique in which the system alternately “freezes” and “melts”—releases and absorbs heat—indefinitely; this concept was developed for the Skylab spacecraft to provide efficient, maintenance free heat storage in a compact package. Energy Garden's voice synthesis microprocessor also draws upon space technology, as do the unbreakable covers on the Master Module and Amplifier. The latter units are coated with a glazing material that offers high solar radiation transmission characteristics; the material was originally developed by DuPont and used on the Apollo Lunar Module to protect it from meteorite damage. ▲

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